Ph. D. SYNOPSIS

A STUDY ON STOCK PRICE INDEX IN SHARE MARKET USING TIME SERIES TECHNIQUE

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TITLE

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1. Introduction

The proposed topic for research study is in statistics. This topic is research extensive process of building time series model for stock price prediction. The experimental result obtaining with best time series model to predict stock prices of Commodity in share market satisfaction on short term basis. This could guide investor in stock market to make profitable investment decision with the result obtaining well with emergence forecast techniques in short term prediction. The Indian stock exchange globally hold place of prominence the information regarding a stock is incomplete, complex uncertain and vague making it challenge to predict the future performances of economics. People invest the stock market based on analysis. To predict the new price of stock movement becoming the challenge because of the complexity of the stock exchange market data.

The Bombay stock exchange (BSE) is one of the oldest exchanges across the world, while the National Stock Exchange (NES) is the among the best in terms of sophistication and advancement of technology. The following gives the exchange name with indices name. (i)Bombay stock exchange (sensex). (ii) National stock exchange (N &S niftys). The Indian stock market is the world third largest stock market on the basis of invester base and has a collective pool of about 20 million investor. There are over 9000 companies listed on the stock exchange of the country. The Bombay stock exchange established in 1875 is the oldest in Asia.

National stock exchange, a more rest establishment which come in to existence 1992 is the largest and most advanced stock market in India is also the third biggest stock exchange in Asia in terms of transation. It is among the five biggest stock exchanges in the world in terms of transaction volume.

An investment in the stock market is regarded as high risk as well as high gain and attracts large number of investor The investors invest in the stock market based on some

analysis, the investor searched for Tools and methods that would increases their gain while minimizing their risk .The analysis stock movement the predictive modeling can guide an investor in identifying and maximum performance securities good investment investor decision statistical technical analysis as fundamental analysis, linear regression, ARIMA and Auto-covariance are all use attempt to predict and benefit from the stock exchange market direction.

Time series model

A Time series is sequential set of data points, measured typically over successive time. It Mathematically defined as a set of vector x(t), t = 0,1,2,….. where t represents the time. The measurements taken during an event in a time series are arranged in a proper chronological or historical order

Components of time series: A time series are the four components which can be separated from the observed data. These components are Trend, Cyclical, Seasonal and Irregular components .Considering the effect of these four compounds two different types of model are generally used for a time series viz. Multiplication and Additive models

Multiplication model $Y(t) = T(t) \times S(t) \times C(t) \times I(t)$

Additive model $Y(t) = T(t) + S(t) + C(t) + I(t)$

Time series and stochastic process: A time series is non –deterministic in nature, i.e. we can not predict with certain what will be occurs in future. Generally a time series {x (t), t = 0, 1, 2…} is assuming probability model. Which describe the probability structure of a time series termed as a stochastic process. Usually assumption is that the time series variable xi is independent and identically distributed (i.i.d) follows the normal distribution.

Time series forecasting using stochastic model: There are two widely used linear time Series models in literature, viz. Autoregressive (AR) and Moving Average (MA) models. Combing these two the Autoregressive Moving Averages (ARMA) and Autoregressive Integrated Moving Averages (ARIMA) models. The Autoregressive fractionally integrated

moving averages (ARFIMA) models. Generalizes ARMA and ARIMA models for seasonal time series forecasting a variation of ARIMA viz. the seasonal Autoregressive Integrated moving averages (SARIMA) models used ARIMA model and its different variations are based on the famous Box-Jenkins principal known as Box-Jenkins principal or Box-Jenkins Model. Linear models have drawn much attention due to their relative simplicity in understanding and implementation. However many practical time series shows non linear pattern some of non linear models are like generalized ARCH (GARCH), Exponential Generalized ARCH (EGARCH) etc.

ARIMA model is statistical technique model perspectives generally, it is reported in literature that prediction statistical and artificial intelligence technique. Box and Jenkins in 1970 introduced the ARIMA model. It also referred to as Box- Jenkins Methodology composed of set of activates for identifying, estimating and diagnosing ARIMA models with time series data. The model is most prominent method in financial Forecasting ARIMA model has shown efficient capability to generate short term forecasts. In ARIMA model, the future value of a variable is a linear combination of past values and past errors expressed as

$Y_t = \emptyset_0 + \emptyset_{t-1} + \cdots \ldots \ldots + \emptyset_p y_{t-1} + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \theta_2 \epsilon_{t-2} \ldots \ldots \ldots \theta_{it} \varepsilon_{tj}$

Where Y_t is the actual value and ε_t is the random error at t

$\emptyset_t$ and θ_j are the coefficient, p & q are integers that are obtain referred to as

autoregressive and moving averages respectively.

ARIMA is an acronym for autoregressive integrated moving average. The order of an

ARIMA model is usually denoted by notation ARIMA (p, d, q)

Where p – is the order of the autoregressive part

q- is the order of the moving average process

Mathematically the pure ARIMA model is written as

$W_t = \mu + \frac{\theta_B}{\emptyset(B)} a_t$

Where t –index time

Wt –is the response series

μ - is the mean term

B – is the backshift operator,

i.e. $B_{Xt} = x_{t-1}$

$\emptyset(B) -$ is the autoregressive operator represented as a polynomial in the backshift operator

$\emptyset(B)$ = 1- $\theta_{1B-\cdots\cdots\cdots} - \theta_Q B_Q$

a_t - is the independent disturbance or random error

The experimental results obtained with best ARIMA model demonstrated the potential of ARIMA model to predict stock prices satisfaction on short term basis. This could help investor in stock market to make profitable investment decisions with the result obtained ARIMA models can compact reasonably well with emerging forecasting technically.

2. REVIEW OF LITERATURE

In many cases the researchers had attempt to establish a linear relationship between the input microeconomic variables and stock return, but with the research of Abhyankar et al 1997 he found that there has been a great shift in the focus of the researcher uses the non linear prediction of the stock returns. Although thereafter many researchers used the nonlinear models. But reason of stock market prices returen, being noisy, uncertain and nonlinear in nature, ANN (Application of neural network) has evolved out to be better technique in capturing the structural relationship between a stock performance and its determinant factors more accurately then other statistically techniques (ref.et.al.Wu et al schoeneburge).

Chan, wang and Lan implemented a neural network model using the technical analysis variables for listed companies in shanghai stock market for performing two learning algorithm and two weight initialization methods are compared. The result reported that prediction of stock market price is possible using two techniques and algorithm and initialization methods.

Other prominent literatures are that of Siekman et. al. (2001) who used fuzzy rules to split inputs in to increasing, stable and decreasing trend variables. Siekman et al (2001) implemented a network structure containing adaptable fuzzy parameter between two layer increasing and decreasing trend variable. Ksshiwa and tokin naga (2000) used a wavelet trends transform to extract the short term feature of sock trends. Kim and Han (1998) used refined probabilistic NN (PNN) to predict a stock market index. and (2000) used neural network modified by genetic algorithm. In literature papers are also available in Indian contents Panda

Narasimhan V. used the artificial neural network to forecast the daily return of Bombay stock exchange (BSE) sensitive index (sensex). They compared the performance of random walk and linear autoregressive models and reported that neural network out-performance, linear autoregressive and random walk models by all performance measures in in-sample and out-of-sample. forecasting of daily BSE sensex return.

A study of effectiveness of time series modeling (ARIMA) in forecasting stock prices, (IJCSEA) (vol-4,,no-2,2014) ,Prapanna mandal, Labnishit and saptarsi Goswami conclude a study on fifty six stock from seven sectors which are selected a listed in national stock exchange (NSE) [19]. They selected twenty three months of data for the set empirical study and evaluate the accuracy of the ARIMA model in predicting the stock prices using AIC to select the best ARIMA model .Also they changed the time priod of preoul or historical data and studied its effect on accuracy.

Gaurav Agrawal, Anirudha kumar shrivastav, Ankita shrivastav studied on 'Exchange rate movement and stock market volatility' and analysis the relationship between nifty return and Indian rupee US dollar, exchange rate ,gross domestic product exchange rate, interest rate, current account, money supply their information etc. impacted daily stock prices. I.M. pandey (2002) in study entitled ' Is their seasonality in the senex month return' the study considers seasonal or monthly stock returns in several developed and emerging market and also investigates the existence of seasonality in Indian markets using the money return data of BSE sensitivity index for the period from April 1991 to March 2002. The collected data are analyzed regressive, moving average, ARIMA model. The result of the study observed that investor

during the end of the year sell shares whole value have declined to book losses in order to reduce their taxes. This study confirms that the Indian stock market many not efficient as consequence perhaps investor can impress their returns by timing their investments.

Sudarvel, Dr.R. velmurgan in his study entitle 'Indian stock market anomalies: A literature review'. The result of study observe that unlike holidays exist in a year that causes market close and increase the non-trading days in a year. Investor usually sells more before the holidays and they buy after the holidays. The stock return in Indian stock market were not entirely random and may not efficient .SEBI as a regular of Indian stock market should take necessary step to increases efficiency of Indian stock market.

3. Objectives of the research study: Following are the main objectives of the study

1. To know the ups and down of stock market from the last five years. (2012-2017)

2. To study the existing methods for prediction of Indian stock market BSE and NSE,

3. To find the variation in between BSE and NSE per 100 return.

4. To study the index prices of commodities from 2012 to 2017

5. To study the whole sale and retail price index of BSE and NSE.

Some of the proposed hypothesis research studies are as follows:

1. There is continuous fluctuation in the stock market from last five year. (2012-2017).
2. There is no significant in the existing methods of prediction of Indian stock market of BSE and NSE.
3. There is difference between the BSE and NSE per 100 returns.
4. There is no significant difference between whole sale and retail price index of BSE and NSE.

Research methodology: Sources of data collection:

Secondary source of data collection: for this research study secondary will be used from various sources like: report of BSE, NSE, published data of statistical journals, published data of government offices, agencies of stock markets, economics journals, National, International research papers/ articles, newspapers, books and extensive use of related website.

6. References.

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5. PROPOSED WORK PLANE/FORMULATION AND STRUCTURE OF STUDY

RESERCH DESIGN/CHAPTER SCHEM FOR SYSTEMATIC SIMPLIFIED RESERCH STUDY PROPOSAL

Chapter 1 : Introduction: Meaning of prediction time series models, linear regression, ARIMA Model

Chapter 2 : Review of literature

Chapter 3: Collection data of stock market and Methodology

Chapter 4: Data analysis

Exchange (NSE), Government registered record, references of published national and International published journals, monthly, weekly economic journals, googal, yahoo Websites

Chapter 5: Analysis Resul

Chapter 6: conclusion

Chapter 7. List of **Tables**.

List of Graphs

Reference: Bibliography

Webliography

Research guide

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